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FIVE-YEAR REVIEW REPORT

MADISON METROPOLITAN SEWERAGE DISTRICT LAGOONS SITE

TOWN OF BLOOMING GROVE, DANE COUNTY
WISCONSIN

March 2003

Prepared by:
United States Environmental Protection Agency
Region 5
Chicago, Illinois

William E. Muno, Director
Superfund Division, Region 5

3/25/03
Date

Table of Contents

Tables

Figures

List of Acronyms

AOC	Administrative Order on Consent (Consent Decree)
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
U.S. EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PPB	Parts per Billion
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
VOC	Volatile Organic Compound
WDNR	Wisconsin Department Natural Resources

FIVE-YEAR REVIEW REPORT
EXECUTIVE SUMMARY
March 2003

MADISON METROPOLITAN SEWERAGE DISTRICT LAGOONS SITE

Dane County
Wisconsin

The completion of the current five-year review confirms that the Madison Metropolitan Sewerage District Lagoons Site remains protective of human health and the environment. The remedy selected in the1997 Madison Metropolitan Lagoon (the Site) Record of Decision (ROD) has been implemented under the 1992 Administrative Order on Consent (AOC) entered with the Madison Metropolitan Sewerage District (MMSD) and the United States Environmental Protection Agency (U.S. EPA) for the site. This is the first five-year review for the Site.

The remedy for the Madison Metropolitan Sewerage District Lagoons site in Madison, Dane County, Wisconsin included isolation and containment followed by establishing a vegetative cover, monitoring and maintaining institutional controls. The site achieved construction completion with the signing of the Preliminary Close Out Report in September 2001.

The five-year review found that the remedy was implemented in accordance with the requirements of the ROD.

The remedy is functioning as designed. The immediate threats have been addressed and the remedy remains protective of human health and the environmental in the short term. There are no current exposure pathways.

Long-term protectiveness of the ground water has been achieved and will remain protective by maintaining institutional controls. Operation and maintenance of the containment system has been effective. Hazardous waste remains in place, therefore U.S. EPA is required to conduct a Five-Year Review in another five years January 2008.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: Madison Metropolitan Sewerage District Lagoons

EPA ID *(from WasteLAN)*: WID078934403

Region: 5	**State:** WI	**City/County:** Blooming Grove / Dane County

SITE STATUS

NPL status: ☒ Final ☐ Deleted ☐ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete

Multiple Ous?* ☒ YES ☐ NO	**Construction completion date:** 9 / 15 / 2001

Has site been put into reuse? ☐ YES ☒ NO

REVIEW STATUS

Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: David Linnear

Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 5

Review period:** 1 / 12 / 1998 to 03 /01 / 2003

Date(s) of site inspection: 2/ 20 / 2003

Type of review:

☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion)

Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:

☒ Actual RA On-site Construction at OU # 1 ☐ Actual RA Start at OU# NA
☐ Construction Completion ☐ Previous Five-Year Review Report
☐ Other (specify)

Triggering action date *(from WasteLAN)*: 1 / 12 / 1998

Due date *(five years after triggering action date)*: 1 / 12 / 2003

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issue:

1) Because waste remains in place, National Contingency Plan (NCP) requires U.S. EPA to conduct a Five-Year Review at this site.

2) Continuing need for continual operation and maintenance of containment system.

Recommendations and Follow-up Actions:

1) Conduct second Five-Year review January 2008.

Protectiveness Statement(s):

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed.

Long-term Protectiveness:

The remaining component of the cleanup is operation and maintenance of the containment systems. Operation and maintenance of the systems has, on the whole, been effective. The PRPs and EPA are and will continue to evaluate opportunities for system optimization.

Other Comments:

None.

U. S. Environmental Protection Agency
Region 5
Five-Year Review
Madison Metropolitan Sewerage District Lagoons Site
Blooming Grove, Dane County, Wisconsin
March 2003

I. Introduction

The United States Environmental Protection Agency (U.S. EPA) Region 5 is conducting a Five-year review of the remedial actions implemented at the Madison Metropolitan Sewerage District (MMSD) Lagoons Site near Madison, Dane County, Wisconsin. The review was conducted between November 2002 and March 2003. This report documents the results of the five-year review. The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, finding, and conclusions of the review are documented in the five-year review report. In addition, five-year review reports identify issues found during the review, if any, and make recommendations to address them.

This review is required by statute. U. S. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA 121(c), as amended, which states:

> If a remedial action is selected that results in any hazardous substances, pollutants, or contaminants remaining at the site, the remedial action shall be reviewed no less often than every five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP part 300.430(f)(4)(ii)of the Code of Federal Regulations (CFR) states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the first five-year review for the MMSD Lagoons Site. Due to the fact that hazardous substances, pollutants, or contaminants remain at the site, this five-year review is required.

II. Site Chronology

Table 1 lists a chronology of events for the MMSD Lagoons Site.

Event	Date
Initial Discovery of Problem	October 1982
Listed of National Priority List	February 1990
Remedial Investigation / Feasibility Study	September 1996
ROD Signature	March 1997
RA Start	January 1998
Site Visit / Inspection	August 2001
Close Out Report	September 2001
Site Visit / Inspection	February 2002
First Five-Year Review	March 2003

III. Background

Physical Characteristics

MMSD Lagoons site consist of two sludge lagoons, totaling approximately 140 acres, that are located adjacent to the municipal wastewater treatment plant facilities, south of the city of Madison in Dane County, Wisconsin. The Nine Springs Creek flows along the south and east site borders. Several drainage ditches run along other site borders and empty into the creek.

Land & Resource Use

Land use to the northwest of the sludge lagoons is both commercial and industrial while to the west and southwest, land use is primarily residential. MMSD has operated the Nine Springs Wastewater Treatment Plant use since 1933. A Facilities Plan, prepared during the mid-1970s, recommended reuse of the lagoon sludge by beneficially recycling material for agricultural land.

History of Contamination

In 1942, a 52-acre sludge lagoon was constructed by MMSD with dikes constructed of imported fill material. By the mid-1960s, as the lagoon (Lagoon 1) began approaching it sludge capacity, MMSD constructed a second 86 acre lagoon (Lagoon 2) to the east of Lagoon 1. In April 1970, a portion of the north dike of Lagoon 2 collapsed and approximately 85 million gallons of lagoon

contents were released into the adjacent ditch. In November 1973, dike subsidence occurred along the south side of Lagoon 2. Following repair, MMSD curtailed active use of Lagoon 2. During development of the sludge recycling program in the mid-1970's, as part of a sludge monitoring sampling effort, polychlorinated biphenyl's (PCBs) were detected in the sludge lagoons. In 1982, analysis of a sludge sample from the lagoons first showed the presence of PCB at a dry weight concentration exceeding 50 ppm.

Between 1983 and 1986, the U.S. EPA evaluated the lagoons for potential inclusion on the National Priorities List (NPL). The site was placed on the NPL in February 1990. MMSD performed a Remedial Investigation / Feasibility Study (RI/FS) in September 1996. Based on information collected, associated risks to human health and the environment and consideration of state standards, U.S. EPA concluded remediation was warranted under current / anticipated future land use.

From 1991 to 1993, cleanout / closure were conducted in Lagoon 1 to aid in the removal of sludge and peat. The sludge, which had PCB concentrations less than 50 ppm, was recycled in accordance with all applicable rules and regulations. In 1994, U.S. EPA halted land application of all sludge from the lagoon system, until U.S. EPA had an opportunity to review available information to determine the consistency of land application relative to response actions taken under the Superfund Program. In 1995, U.S. EPA withdrew its restriction, allowing MMSD to remove and land apply sludge with PCB concentrations below 50 ppm, stating that this action would not be inconsistent with future response actions taken at the site. Cleanout / closure activities began in 1997. Closure of lagoons containing less than 50 ppm PCBs was completed in 2000.

Initial Response

In 1982, U.S. EPA and MMSD collected sludge samples from the lagoons. Sampling showed that some areas of the lagoon contained sludge with PCB concentrations exceeding 50 ppm. Hazardous assessments were conducted by U.S. EPA between 1983 and 1986 to determine whether the lagoons warranted listing on the NPL from the potential threat due to sludge. The site was placed on the NPL in February 1990. MMSD conducted an RI /FS, Baseline Risk Assessment (human health and ecological risk) and other associated studies in 1996. These studies were reviewed and approved by the U.S. EPA. In 1996, results showed that the sludge in the lagoons was contaminated with PCB and was a potential health concern to people living near the site. People working cropland where sludge was applied were potentially exposed to PCBs. Surface water in the old effluent channel was tainted from the PCB contaminated sludge. Hunting was occurring in wetlands adjacent to the site. The lagoons were feeding areas for many species of waterfowl.

Basis for Taking Action

Information contained in the RI/FS and Baseline Risk Assessment was used as the basis for

selecting a remedial alternative at the site. The decision for "remedial action" is based on the analysis of site risks. The decision relies on legal assurances that contaminated land will not be used in a way that could pose significant risks, and that monitoring will continue indefinitely. Results from previous investigations, activities and sampling showed that the sludge contained elevated PCB concentrations that presented a potential risk to human health and the environment. The selected remedy for the site was designed to minimize potential exposure to lagoon sludge by human and ecological receptors.

IV. Remedial Actions

Remedial Selection

In November, 1996, EPA issued a proposed remediation plan for the site. The proposed plan met all of the formal selection criteria identified in EPA guidance and the NCP. Selection of the proposed plan was based on a thorough review of the administrative record. In March, 1997, EPA issued a ROD for the site. The ROD specified the following remedy:

1. Construction of intra-lagoonal dikes in order to segregate, isolate and consolidate sludge with PCB concentration at or above 50 mg/kg (dry weight) contained on site.

2. Covering certain lagoon areas with placement of geotextile layer and lightweight soil cover.

3. Seeding with appropriate vegetative growth, monitoring the integrity and maintaining the vegetative cover of all dikes. This soil/vegetative cover would be placed over those portions of the containment area that lacked an existing soil/vegetative cover.

4. Continuation of institutional controls, including supernatant control, periodic dike monitoring and routine dike maintenance. Maintenance of physical barriers which limit access. Placing deed restrictions on the property to control future land use.

5. Long term cap monitoring.

A CERCLA Remedial Action Consent Decree was signed by the District in December, 1997 and entered with the United States District Court for the Western District of Wisconsin in May, 1998. The Consent Decree included a requirement that the District submit a Remedial Design (RD) Report and a Remedial Design Work Plan for U.S. EPA approval prior to initiating the selected remedial response. U.S. EPA approved both submittals in December 1997.

Remedial Implementation

Construction activities associated with the remedial alternative began in January 1998 and included construction of a soil and fabric cover for the lagoons and new dike construction. Sludges in these lagoons with PCB concentrations less than 50 ppm would be used in the MMSD

agricultural program. It was initially anticipated that construction activities would be conducted in three phases over a three year period. However, weather conditions resulted in a one-year delay in project completion. Placement of the geotextile fabric and soil/woodchip mixture was completed in February 2001. Seeding, signage and culvert installation were completed in July 2001.

Operations and Maintenance (O&M)

There are a series of ongoing operation and maintenance activities that are associated with this project. These activities fall into the following general categories:

1. Settlement/consolidation management
2. Surface water control
3. Vegetation management
4. Cover and dike monitoring system

Settlement/consolidation of the sludge underneath the cap and differential settling of the cover material may occur. As part of routine O&M activities, all cells will continue to be inspected annually to determine if placement of minor amounts of additional material is needed in select locations. If necessary, additional cover material will be added.

Surface water control includes the installation of drainage swales and culverts to direct precipitation away from the capped areas and into other segments of the lagoon system where it can then be pumped back to the treatment plant. The effectiveness of the drainage system is evaluated annually through visible inspection. If necessary, existing culverts may be repositioned and/or additional culverts may be installed.

Vegetation management includes reseeding/overseeding of areas on an "as needed" basis and the control of unwanted herbaceous vegetation. Unwanted herbaceous vegetation is generally controlled through periodic cutting/mowing, although other techniques may also be used.

Cover performance and containment dike performance are monitored through a combination of periodic visual observations; measuring consolidation/settlement at strategically placed settlement platforms; surveying the elevation of survey markers; and by collecting information on water pore pressure from the piezometers. It may also be necessary to exhume the soil/woodchip cover at select locations to visually inspect the performance of the geotextile fabric. These inspection activities may identify the need to perform routine maintenance activities such as dike grading, placement of additional soil/woodchip material on the cover, pumping of any accumulated precipitation, reseeding, etc.

V. Progress Since the Last Five-Year Review

This is the first five-year review for the MMSD Lagoons Site.

VI. Five-Year Review Process

ADMINISTRATIVE COMPONENT

The Madison Metropolitan Sewe. .ge District Lagoons Site five-year review was prepared by David Linnear, U.S. EPA Remedial Project Manager. The five-year review consisted of a Site inspection and review of relevant documents, including O & M records. The final report will be available in the Site information repository for public view.

COMMUNITY INVOLVEMENT

Overall, community interest in this site has been low. However, notification will be made to the public of these five-year review findings allowing input. Information on where to locate a copy of this report, if necessary, is also included in the notice.

SITE INSPECTION

Inspections at the site were conducted in February 2003 by the U.S. EPA. The purpose of the inspections was to assess the protectiveness of the remedy and visually verify institutional controls. The 1992 Administrative Order on Consent (AOC) and monitoring devices are in place for the required remedy. MMSD owns the property on which the lagoons exist and the AOC includes language which indicates their ownership and environmental liability. Vegetation is present on each of the 5 existing lagoon cells. The maturity of the vegetative growth varied according to the initial placement and type of seeding used. Settlement and stabilization of the geotextile cap were being controlled through appropriate elevations and drainage. Drainage designed dikes and culverts were removing surface water from the cap into the designated retention ponds before being pumped away. The cap and holding cell appeared to be operating properly.

During all past site visits and site inspections, no significant issues were identified. Institutional controls were implemented and no activities were observed that would have violated the institutional controls.

DOCUMENT REVIEW

Review of the Site Remedial Actions demonstrates the remedy remains protective of public health and the environment. The purpose of the reviews is two-fold: (1) to confirm that the remedy as spelled out in the ROD and/or remedial design remains effective at protecting human health and the environment (e.g., the remedy is operating and functioning as designed, institutional controls are in place and are protective), and (2) to evaluate whether original cleanup levels remain protective of human health and the environment. Reviewing applicable or relevant and appropriate requirements (ARARs) and To Be Considered (TBCs) are key elements in fulfilling these two purposes.

DATA REVIEW

This is a containment remedy and no data is collected on the contaminant (PCBs). The containment cells are designed to remain in place forever. Ground water and soils are not affected, therefore, there is no data to be reviewed.

VII. Technical Assessment

The following questions address the issue of protection of human health and the environment by the remedy at the Madison Metropolitan Sewerage District Lagoons Site.

Question A: Is the remedy functioning as intended by the decision document?

The review of documents, risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD. The remedy has achieved the remedial objectives to minimize the migration of contaminants to ground water and prevent direct contact with, or ingestion of, contaminants in soil.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Changes in Standards and To Be Considered: Neither federal Maximum Contaminant Levels (MCLs) nor State ground water standards for Site-related contaminants have changed since the ROD. All other regulations at the Site remain unchanged.

Changes in Exposure Pathways: There have been no new exposure pathways discovered at the Site.

Changes Toxicity and Other Contaminant Characteristics: There have been no changes to toxicity and other factors for contaminants of concern.

Changes in Risk Assessment Methodologies: There have been no additions or changes in risk assessment methodologies used at the Site since the ROD which affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary
According to data reviewed and the site inspection, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

VIII. Issues

The cap needs continuous monitoring for proper vegetative grow h, compression, wicking, stabilization and drainage. The five cell lagoon system needs continuous monitoring of drainage design.

IX. Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone	Current / Future Protectiveness? (Y/N)
Continue monitoring cap settlement	Continue to monitor for proper compression, stability and drainage;	MMSD	State/EPA	Spring 2007	Y / Y
Continue O&M.	Continue to monitor effectiveness of systems	MMSD	State/EPA	Spring 2007	Y / Y

X. Protectiveness Statement

The remedy is protective of human health and the environment. The exposure pathways that could result in unacceptable risks are being controlled and institutional controls are preventing exposure to, or the ingestion of, contaminants or soil. All threats at the site have been addressed through implementation of institutional controls. Current data indicate that the contaminants remains on site and the remedy is functioning as required.

XI. Next Review

The next five-year review for the MMSD Lagoons Site is required by January 2008.

FIGURES

Madison Metro Superfund Site

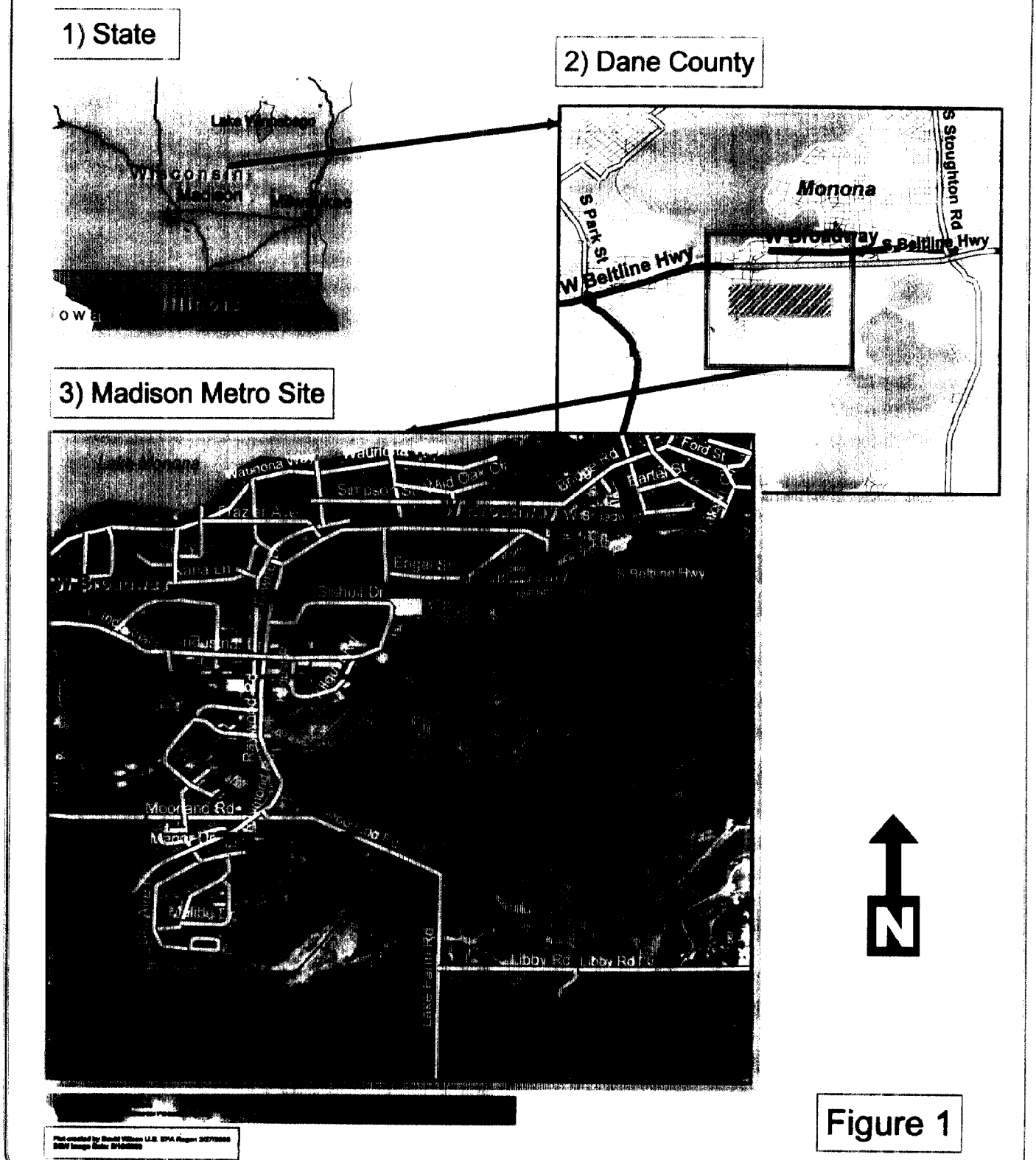
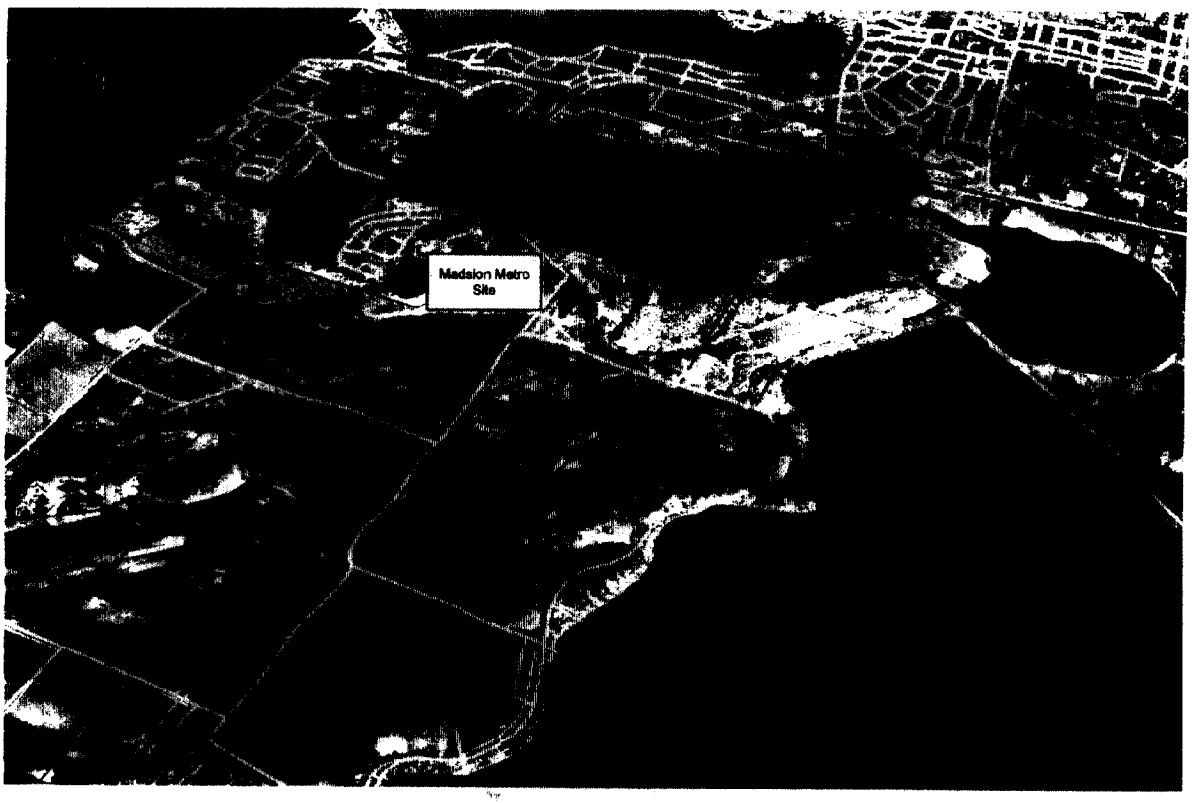


Figure 1

Madsion Metro Superfund Site
3D Surface Terrain Model



Elevation

- 949 - 1063
- 845 - 851
- 851 - 858
- 858 - 864
- 864 - 873
- 873 - 887
- 887 - 908
- 908 - 949
- 949 - 1063

N

Figure 2

Plot created by David Wilson U.S. EPA Region 5 on 2/28/2003
R&W Image Date 5/16/2000